

isolation to 200 feet above the Smoky Hill River, the summit capped by a heavy ledge of light gray, very hard siliceous rock, which has been weathered into miniature grottoes in the higher of the two cones. Underlying the Pliocene beds is a thick deposit of chocolate-coloured shales, with concretionary masses of limestone and septaria, and splendid crystals of selenite. Among Post-Tertiary deposits, examples are to be found, in the eastern portion of the State, of the Drift and Loess, the latter being strikingly displayed in the bluffs that bound the Missouri River valley for so many hundreds of miles in the States of Iowa, Nebraska, Kansas, and Missouri.

An appendix to the foregoing geological account is added on the botany of Kansas, by Prof. J. H. Carruth, but it is very short, for the reason that the catalogue of Kansas plants was made in 1880, and the present notice is merely to record certain additions (about 36) to the 1450 plants already found, of which only 30 are non-flowering. Considering that New York, with its varied surface and qualities of soil, can only show 1450, it is most interesting to note that Kansas, with its comparatively uniform soil and surface, produces almost as many.

A valuable report on the Kansas entomology is given by Prof. Popenoë, who furnishes detailed accounts of certain insects that commit ravages upon the crops. Among these figure prominently the large poplar-borer (*Plectrodera scalaris*), which is a great tree-destroyer, making innumerable holes in the trunks of the willow and cottonwood. A singular fact is recorded of the buck moth (*Hemileuca maia*), viz. that as a larva it possesses a peculiar means of defence. The coarse, black prickles with which the body is covered are very sharp, and when they penetrate the skin on the back of the hand or elsewhere, they produce little pustules and a sharp nettle-like sting, though not of any duration. The red-lined tree-bug (*Lygaeus trivittatus*) is a relative of the well-known squash-bug, and does infinite damage to the elder-tree, besides evincing a strong partiality for the interiors of greenhouses, where it destroys geraniums, ipomeas, abutilons, and other horticulturists' pets. The chequered snout-beetle (*Aramigus tessellatus*) has usually been known to infest leguminous plants, and more especially the silver-leaved prairie pea (*Psoralia argophylla*). Latterly, however, it has been noticed to pay great attention to the sweet potato, and has inflicted considerable havoc on that crop. The harlequin cabbage-bug (*Strachia histriomita*) attacks the Cruciferæ, and especially the wild cress (*Lepidium*), mustard, radish, turnip, and cabbage. The abundant little beetle known as the corn-root worm (*Diabrotica longicornis*) has only recently been discovered to be a corn-pest of the first magnitude, attacking the roots about the period of "earing," and causing a partial development of the grains.

Though only the points that bear most on Kansas natural history have been noticed here, it should be stated that the volume gives an exhaustive account of the resources and statistics, commercial, social, and educational, of each county in the State, and that the whole is illustrated by an admirable series of maps.

G. PHILLIPS BEVAN

NOTES

THE death is announced of Ferdinand von Hochstetter, the German mineralogist and geologist, whose name is intimately associated with the geology of New Zealand. Hochstetter was born in Württemberg in 1829. In 1857 he joined the *Nova* expedition, but quitted it at New Zealand, the geology of which he spent a considerable time in investigating. In 1860 he was appointed Professor of Mineralogy and Geology in the Polytechnic Institute of Vienna, and in 1867 was made President of the Vienna Geographical Society. Among his published works are: the "Topographico-Geological Atlas of New Zealand";

"Geology of New Zealand"; "Palaeontology of New Zealand"; "The Geology of the *Nova* Expedition"; "Roto-mahana and the Boiling Springs of New Zealand"; besides works on the geology of Eastern Turkey, the Ural, and various popular publications.

In the name of fair criticism, in the interests of true science, and in defence of a man who has grown gray in the public service, and who has recently retired full of years and honour to the rest he so well merited, a protest should be made against the language in which the *Mining Journal* last week permits itself to speak of Mr. Robert Hunt, F.R.S. We do not choose to discuss the relative merits of the new "Mineral Statistics" and those with which his name is so familiarly conjoined. But by all who know how entirely Mr. Hunt's heart and soul were in his work at the Mining Record Office and how unweared were his labours on its behalf, an emphatic and indignant repudiation will be made of the charge brought by the anonymous critic that he failed to do his duty and set a bad example to his subordinates. Mr. Hunt needs no defence from such an odious charge. We cannot but express our regret that it should have been made in the columns of a respectable journal and under cover of an anonymous review.

WE are still a long way from admitting that a little elementary physiological knowledge is a desirable element in general education. But it is not often that such a glaring example of the want of it is met with as is revealed by the following extract from a despatch of the Acting Consul at Panama recently presented to Parliament. It would not be easy to find its parallel among the worst answers in the May examinations of the Science and Art Department:—"Many essays have been written on this appalling scourge [yellow fever], its origin, and its existence, but nothing seems more probable, more reasonable to me, than comparing the human blood to milk, which under influence of temperature and circumstances becomes curdled. In the like manner, the human blood, the human frame and organism, under certain abnormal, adverse, and unfavourable circumstances, become curdled, and enter into a state of dissolution, more or less rapid; the blood, owing to its component parts, coagulates, being impregnated with bile, phosphate, and albumen, through the stagnation of the liver and kidneys. This my theory is the one I certainly believe in. Savants assert that the disease is generated by spores of the marine mushroom (*Mycenium fungii maris*), which multiply in thousands per minute. Others profess it to be animalculæ termed 'microbes.'"

MR. JOSEPH THOMSON, the leader of the Geographical Society's expedition to East Africa, has arrived in this country. Mr. Thomson has suffered greatly from the hardships which he had to endure, and it will be several weeks before he regains his usual vigour. Mr. Thomson's expedition has been completely successful, and he himself estimates the results as of far greater scientific importance than those of his first expedition. The region traversed by him, from Mombassa to the north of Victoria Nyanza, is entirely volcanic, and his observations therein will be of great geological interest. There is still one volcano, west of Kilimanjaro, which shows signs of activity. Mount Kenia, though covered with trees, stands amidst a desert. The Masai, the leading people of the region explored, are of special interest. Their features, customs, dwellings, religion, language, differ markedly from those of any other African people with whom Mr. Thomson is acquainted. Fortunately besides his copious notes he has brought home many photographs, so that his forthcoming narrative is sure to be of unusual interest and value.

THE Conference on Water Supply by the Society of Arts will be held at the Health Exhibition to-day and to-morrow. The Conference will meet each day at 11 a.m., and will sit till 1.30, then adjourn till 2, and sit again till 5. p.m. The papers and

discussions will be arranged under the following heads :—1. Sources of Supply. 2. Quality of Water ; Filtration and Softening. 3. Methods of Distribution ; modes of giving pressure, house fittings, discovery and prevention of waste, &c., &c. The proceedings will be continued on Friday, and if necessary on Saturday. The readers of papers will be restricted to twenty-five minutes. Speakers will be restricted to ten minutes. The papers to be read will, in most instances, be printed and distributed in the room.

LORD REAY has received additional names of foreign delegates to the International Conference on Education from Austria, Baden, Belgium, France, Netherlands, and Switzerland. Prussia and Denmark contribute reports on the state of education in those countries. Lord Carlingford will preside at the opening meeting on August 4, at 11 a.m.

AT the request of the Council of the British Association for the Advancement of Science, Admiral Sir Erasmus Ommanney, C.B., F.R.S., has consented to act as Treasurer during the meeting at Montreal, Canada. We learn that Prof. W. G. Adams of King's College will be unable to give the Friday evening lecture at Montreal, and that Prof. O. J. Lodge will take his place. The subject of Prof. Lodge's lecture will be "Dust." Prof. Bonney sails for Montreal to-day.

THE death is announced of the Swedish chemist, Prof. Sten Stenberg, born in 1825.

ACCORDING to a note contributed to a recent number of the *China Review* by M. A. Fauvel of Hankow, the Foreign Office and the authorities at Kew are anxious to know the name of the tree from which the well-known tea-chests are manufactured. The Chinese name is of little use for classification, as it applies to the *Acer*, *Liquidambar*, and perhaps to other species. A branch of the tree and some old leaves and fruits were submitted to M. Fauvel, but the fruits had lost their seeds, and the leaves were too old and decayed to be considered as good specimens for identification. But at first sight he recognised the fruits as those of a *Liquidambar*; the leaves were all trifid, palmately nerved, some slightly serrated, some with a smooth edge. But they were too old to show any signs of gland in the serration. They differ from those given to the *Liquidambars* in general, and from the *L. Orientale* and *L. Chinensis* varieties. M. Fauvel thinks the wood may belong to the *L. Formosana*, but must defer any definite opinion until the leaves and flowers are out. It is somewhat curious that there should be any mystery at this time of the day about so common a substance as the wood of a Chinese tea-chest.

THE last number (16) of the *Excursions et Reconnaissances*, the official publication of the Colonial Government of Cochin China, contains as usual several papers of scientific interest on that region. The first is a report by two engineers, MM. Vienot and Schröder, of a survey undertaken for railway purposes of the country from Haiphong to Hanoi. The first part of the line from Haiphong to Haidong is about 45 km. in length, and the writers of this report describe the physical features of the district, the courses of the rivers, the villages, towns, and cities, the various productions—in short, everything bearing on the question of the construction of a line through the place. This is followed by a translation of a Chinese work on the mines of Cochin China, from which it appears that useful and precious metals are to be found there, and were at one time worked with success, although owing to the defective native methods the work had to be given up. M. Aymonier also contributes some interesting notes on the customs and superstitious beliefs of the Cambodians.

ACCORDING to the *Japan Weekly Mail*, the meteorological system of Japan now comprises twenty-three observatories in the

most important places throughout the country. Reports are sent from each district to the central observatory in Tokio three times a day, and are there thrown into suitable form for publication by the leading journals in the capital and the open ports. To a German, Dr. E. Knipping, belongs the credit of elaborating and perfecting the whole system. In China, the Shanghai Chamber of Commerce has also assisted Père Dechevrens in his meteorological work by making him an annual grant of about 300*l.*

A RECENT writer in the *North China Herald* discusses the part played by mercury in the alchemy and *materia medica* of the Chinese. Cinnabar was known to them in the seventh century before the Christian era, and its occurrence on the surface of the earth was said to indicate gold beneath. Their views on the transformation of metals into ores and ores into metals by heat and other means took the form of a chemical doctrine about a century before Christ, and there is now no reasonable doubt that the Arabian Geber and others (as stated by Dr. Gladstone in his inaugural address to the Chemical Society) derived their ideas on the transmutation of metals into gold and the belief in immunity from death by the use of the philosopher's stone from China. Among all the metals with which the alchemist worked, mercury was pre-eminent, and this is stated to be really the philosopher's stone, of which Geber, Kalid, and others spoke in the times of the early Caliphs. In China it was employed excessively as a medicine. On nights when dew was falling, a sufficient amount was collected to mix with the powder of cinnabar, and this was taken habitually till it led to serious disturbance of the bodily functions. In the ninth century an Emperor, and in the tenth a Prime Minister, died from overdoses of mercury. Chinese medical books say it takes two hundred years to produce cinnabar ; in three hundred years it becomes lead ; in two hundred years more it becomes silver, and then by obtaining a transforming substance called "vapour of harmony" it becomes gold. This doctrine of the transformation of mercury into other metals is 2000 years old in China. The Chinese hold that it not only prolongs life, but expels bad vapours, poison, and the gloom of an uneasy mind.

THE Peabody Institute of the City of Baltimore is an educational institution founded in his native city by the rich philanthropist, and worked for the advantage of a rather higher class of students than those of the ordinary free library. It combines under one government, as we have before urged the advantage of combining, the library, the lecture-room, music, and art, besides an annual expenditure in prizes for certain schools in Baltimore ; and each department is managed by a sub-committee so small as to make every member of it probably feel himself greatly responsible for its success. The lecture committee provided six lectures each upon "The Sun and Stars," and "The Yosemite Valley," &c., and four lectures each upon "The Crusades," "The Minds of Animals," and "Shakespeare's Plays," all except the last assisted by illustrations. These formed a series of two lectures weekly during the four winter months, and season tickets were sold at a price not much exceeding threepence a lecture, the expense to the Institute being about 100*l.* The Conservatory of Music sets itself a high ideal, and claims considerable success. It employs five professors of music, who have had 160 pupils under them, but no pupil reached the level of earning their diploma. A series of fifty-one lectures, concerts, and rehearsals were given, to all of which annual subscribers are free at a small cost similar to that of the lectures, with a charge upon the Institute of about one-seventh of the entire amount spent in the cultivation of music. Upon a Gallery of Art open for eight months during the year, and helped by a loan of pictures, the Trustees were unable to spend any capital sum, and the expenses were limited to the care-takers. Over 1200 dollars were spent according to

Mr. Peabody's will in premiums and medals given to four schools in Baltimore. The library, however, is the object of largest expenditure, and aims at being a high-class one in every respect, 12,000 dollars, or one-quarter of the entire expenditure, having been laid out in the purchase of books. Important and uncommon works are added, supplying the demands of scholars for minute information. Such students are its most numerous users, and there were but few works of fiction among the 2700 volumes added during the past year. The library now reaches a total of 82,000 volumes. A catalogue of these is being compiled, the first volume of which, heartily recommended by many scholars and bibliographies, and already leading to greater use of the library periodicals, contains 868 pages and 61,184 references, yet only takes in A-C. We are told that it is offered under cost price at seven dollars to subscribers, but the Provost's remark which follows, that, besides being very expensive, "it is not desirable to sell many copies," shows how little the Institute aims at popularity. And in no department, truly, can this be boasted of! The lectures seem to have been the most successful. The Report observes that the annual members of the Conservatory of Music ought to rise to 400 or 500 instead of 87; and 70 visitors a day is not many, out of a population of nearly 400,000, to the Gallery of Art. Less than 60,000 issues have been made out of the great library, and the Provost thinks that the public will be surprised to hear that a total of 100,000 persons have visited the buildings for its various purposes during the year! These numbers show how, in America as well as in England, a small rise in requirements brings one into a much rarer, less crowded stratum of society. However, in all departments increased interest and "remarkable progress" are reported, which we trust may increase tenfold.

AT a meeting of the Vaccination Officers' Association held on Saturday last, a cordial vote of thanks was given to the National Health Society for issuing their pamphlet entitled "Facts concerning Vaccination," and the Association expressed their appreciation of "the thoughtful kindness which prompted the Society to assist the vaccination officers of the metropolis in the discharge of their often difficult duties." We are informed that the pamphlet in question has now been distributed from house to house in most of the districts in the metropolis where small-pox is epidemic, and that the demand for it still continues. Something like 150,000 copies have already been issued since the present epidemic began.

AS a supplement to our note of a meteor seen on the west coast of Norway on May 27 (p. 200), it will be interesting to read the following particulars supplied by Mr. Gjestland, residing at Tynsas, in the province of Bergenhus. This gentleman states that he too saw the fire-ball a little after eight o'clock, and subsequently heard a report as of distant rolling thunder. A couple of days after he happened to be on a farm, Midtvaage, in Onarheims parish, where a woman told him that she had seen the "ball" fall a few feet from the house. On learning this Mr. Gjestland, in connection with the parish engineer, began a search in the direction indicated, and discovered, in a spot where the turf covers the mountain ridge to a depth of about 20 cm., a hole where the turf and mould had been as it were blasted away from the rock, and in it a handful of pulverised stone, which, however, in every respect seemed to resemble the mica schist of the mountain. Two days after he learnt that a girl on the same farm had found a very peculiar stone near the same spot, which was thought to be the one searched for. Mr. Gjestland at once proceeded to the farm, and has succeeded in obtaining the valuable specimen. He states that in shape and size it is like the fourth part of a large Stilton cheese, cut vertically from the centre to the side. The height as well as the diameter is 20 cm. A fresh fracture on the surface shows that a bit has been broken

off, probably by striking the rock, while the other side shows an uneven, undulating surface partly polished. The exterior is sooty and dark in colour, indicating that it had been exposed to great heat, whilst the interior is grayish brown and interspersed with bits of metal having the appearance of iron, some of which are 1 mm. in length. The block has a considerable specific weight, resembling that of iron-stone, is brittle, and may be cut with a knife. The weight is 19·5 kilos.

ON July 3, at 9.32 p.m., a brilliant meteor was seen in Stockholm, crossing the sky from south-east to north-west, about 22° from the zenith. The colour was first red, then yellow and green, and became finally white as the meteor parted into halves about 45° above the horizon. It afterwards burst into fragments. When at its point of culmination, the meteor had the appearance of a kernel about a third of the moon's disk in size, with a trail of about the same width and ten times the diameter in length. The whole lasted about four seconds.

THE French Northern Railway Company have begun experiments on motive power generated by electricity at the Chapelle Station. The Company have established an electric lift with two Siemens electro-magnetic machines, one for elevating the weight, and the other for moving the machinery alongside the railway.

DURING the night of July 19 an earthquake was felt at Agram. It lasted four seconds, and was accompanied by subterranean rumblings. No damage was done.

AN unknown benefactor recently offered to give 100,000 marks to the University of Heidelberg, on condition that ladies should be permitted to study there. The University has declined the offer.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus* ♂) from India, presented by Mrs. A. Edwards; a Gray Ichneumon (*Herpestes griseus*) from India, presented by Lieut. A. H. Oliver, R.N.; a Short-toed Eagle (*Circaetus gallicus*), South European, presented by Mr. W. R. Taylor; a Bronze-winged Pigeon (*Phaps chalcoptera*) from Australia, presented by Mr. J. Latham; five Natterjack Toads (*Bufo calamita*), British, presented by Mr. W. Stanley; three Striolated Buntings (*Emberiza striolata*) from Africa, deposited; a Four-horned Antelope (*Tetraceros quadricornis*) from India, a Maccarthys Ichneumon (*Herpestes macrathie*) from Ceylon, three Common Squirrels (*Sciurus vulgaris*), British, six Aldrovandi's Lizards (*Plestiodon auratus*) from North-West Africa, purchased; two Virginian Deer (*Cervus virginianus*), an Argus Pheasant (*Argus giganteus*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

BROSSEN'S COMET OF SHORT PERIOD.—We are now within about two months of the probable time of the next perihelion passage of this comet, and after the middle of August, when the moon draws away from the morning sky, it may be within reach. So far, however, no ephemeris for this return has been published. The perturbations since its last appearance in 1879 will not have been very material, and the mean motion in that year would fix the approaching perihelion passage to about September 14·5 G.M.T. If the longitudes in Dr. Schulze's orbit for 1879 are brought up to 1884·75, the following expressions for the comet's heliocentric co-ordinates result:—

$$\begin{aligned}x &= r \cdot [9\cdot94286] \cdot \sin(v + 20^\circ 56'\cdot7) \\y &= r \cdot [9\cdot98506] \cdot \sin(v + 126^\circ 22'\cdot0) \\z &= r \cdot [9\cdot73705] \cdot \sin(v + 60^\circ 33'\cdot4)\end{aligned}$$

Taking September 14·5 for the epoch of perihelion passage, the comet's approximate positions are:—